

<b>DATA ITEM DESCRIPTION</b>		FORM APPROVAL OMB NO 0704-0188	
1. TITLE Location Surveys and Mapping Plan		2. IDENTIFICATION NUMBER OT-005-07	
3. DESCRIPTION / PURPOSE To describe methods, equipment and accuracy required for location surveys and mapping of Ordnance and Explosives (OE) sites and to provide requirements for the Location Surveys and Mapping Plan at a specific project site.			
4. APPROVAL DATE (YYMMDD) 990825	5. OFFICE OF PRIMARY RESPONSIBILITY CEHNC-ED-CS-D	6a. DTIC APPLICABLE	6b. GIDEP APPLICABLE
7. APPLICATION / INTERRELATIONSHIP This Data Item Description contains instructions for preparing Work Plan chapters addressing location surveys and mapping for OE projects.			
8. APPROVAL LIMITATION	9a. APPLICABLE FORMS	9b. AMSC NUMBER	
10. PREPARATION INSTRUCTIONS  10.1 General. The site-specific Location Surveys and Mapping Plan for each project will document the site specific survey, mapping, aerial photography and Geographic Information System (GIS) requirements tailored to the needs of that project. The Corps of Engineers Huntsville Center (CEHNC) will determine the appropriate mix required for implementing each OE project and the methodology to accomplish the tasks. CEHNC has separate task order contracts that may be used for Survey and Mapping, Geographic Information System (GIS) and Knowledge Base anomaly geophysics analysis. The services may be supplied by the government as GFE or may be included within the task orders of this contract. Some projects may not require any of these capabilities but others may require comprehensive capabilities. Surveying and Mapping products will be required in either metric or English units depending upon the needs of the individual projects. All required services will be accurately specified in the individual project scope of work tasks.  10.1.1 Unexploded Ordnance (UXO) Safety Provision. During all fieldwork and all intrusive activities, the A/E or contractor shall provide a UXO Technician II to accompany the survey crew. The UXO Technician II shall conduct visual surveys for surface ordnance prior to the survey crew entering a suspected area, and a magnetometer survey of each intrusive activity site to ensure the site is anomaly free prior to the surveying crew setting monuments or driving stakes. The UXO Technician II shall not be assigned additional survey tasks which would interfere with the OE safety aspects of area clearance for driving stakes, iron pins, monumentation or other survey control, which will penetrate the surface in an OE contaminated area.  10.1.2 Control Points. Plastic or wooden hubs shall be used for all basic control points. A minimum number (to be specified in the delivery order for each project) of concrete monuments with 3-1/4 to 3-1/2 inch domed brass, bronze or aluminum alloy survey markers (caps) with witness posts shall be established at each site. The concrete monuments shall be located within the project limits, set 10 meters (m) from the edge of any existing road in the interior of the project limits, and a minimum of 300 meters apart. The top shall be set flush with the ground and the bottom a minimum of 0.6 meters below frost depth. NOTE: Revised specifications may be included in each delivery order.  10.1.2.1 Accuracy. Horizontal and vertical control of "Class I, Third Order" or better shall be established for the network of monuments. Horizontal control shall be based on either the English or metric system and referenced to the North American Datum of 1983 (NAD83) and the State Plane Coordinate Grid System. Vertical control, if required, shall also be based on either the English or metric system and referenced to the North American Datum of 1988 (NAVD88). If aerial photographs or orthophotography are used to provide this survey, the aerial targets used for control points shall meet the same horizontal and vertical accuracy and requirements detailed above.			
11. DISTRIBUTION STATEMENT			

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10.1.2.2 Monument Caps. The caps for the new monuments shall be stamped in a consecutively numbered sequence and the identification shall be provided with each delivery order as follows:

SWAMPY-1-1996  
USAESCH

SWAMPY-2-1996  
USAESCH

SWAMPY-3-1996  
USAESCH

Note: The name to be stamped on the caps shall be provided with each delivery order.

The dies for stamping the numbers and letters into these caps shall be 1/8-inch to 3/16-inch in size. All coordinates and elevations shall be shown to the closest one-thousandth of a meter (0.001 m) and one-hundredth of a foot (0.01 ft).

10.1.2.3 Plotting. All of the control points (monuments, aerial targets, and property corners) recovered and/or established at this site shall be plotted at the appropriate coordinate point on a reproducible (Mylar) planimetric or topographic map at scales specified in the delivery order.

10.1.2.4 Description Cards. A tabulated list and a "Description Card" of all control points (monuments and aerial targets) established or used for this project shall be submitted. The Description Card shall show a north arrow; a sketch of each monument and its location relative to reference marks, buildings, roads, railroads, towers, trees, etc.; a typed description telling how to locate the monument from a well known and easily identifiable point; the monument's name or number; and the final adjusted coordinates and elevations in meters and feet (to the closest 0.001m and 0.01 ft.) The Description Cards shall be 5 by 8 inches describing one monument per card, or an 8-1/2 by 11 inch sheet of bond paper may be used for describing two monuments.

10.1.3 Mapping. The location, identification, coordinates, and elevations of all the control points recovered and/or established at the site shall be plotted on reproducible (Mylar) planimetric or topographic maps at the scale specified in the delivery order. Each control point shall be identified on the map by its name and number and the final adjusted coordinates and elevations (to the closest 0.001m and 0.01 ft.). Each map shall include a grid north, a true north and a magnetic north arrow with the differences between them in minutes and seconds shown. Grid lines or tic marks at systematic intervals with their grid values shall be shown on the edges of the map. Also, a legend showing the standard symbols used for the mapping and a map index showing the site in relationship to all other sites within the boundary lines of the project area shall be shown. In addition, the state plane coordinates shall be established for the corners of each grid area investigated (100' by 100'; 100' by 200'; etc.; size and accuracy requirements to be determined when the Scope of Work (SOW) for the delivery order is prepared). The coordinates for the grid corners shall be shown to the closest one foot (1.0 ft.). The locations of individual recovered OE items shall be tape measured or the X and Y distance estimated, to obtain a horizontal accuracy of plus or minus one foot within the grid, and plotted and identified on the map. The use of a total station, global positioning system (GPS) or other precision survey method used to locate recovered munition items is not required.

## 10.2 DIGITAL DATA

10.2.1 General Design File Requirements. An overall planimetric design file shall be created and shall be digitized into a Microstation ". dgn" file at an elevation of zero. If contours and spot elevations are required, all data shall be digitized into a second Microstation 3D design file with each element (contours and spot elevations) at their correct elevation, and topologically triangulated network (ttn) files shall be created to model the topographic surface. The ttn file shall be created using the elements of the topographic file, and all spot elevations, contours, and breaklines necessary to create the ttn file shall be used. The ttn file shall be created so that it can be used in an Intergraph software product INROADS to recreate the contours at their exact locations. Cut sheet plots and views into the project data shall be created by referencing the planimetric and contour files from additional Microstation work files.

10.2.1.1 Each sheet shall be standard metric A-1 size drawing, which is 841 mm by 594 mm (33.1 inches by 23.4 inches). Each sheet shall also have a standard border; revision block; title block; complete index sheet layout; bar scale; legend; grid lines or grid tic layout in feet or meters; a True North, a Magnetic North and a Grid North arrow, with their differences shown in minutes and seconds; and shall be plotted at the horizontal scales required.

10.2.1.2 The cell library used shall be attached and provided with the digital data set along with all other supporting files or data. All production and work files shall be fully documented into a concise data manual. This manual shall include all specific information required for an outsider to be able to recreate all products and determine the location, names, structures, and association of the data such as layer description, weights, colors, symbology, referencing of files etc. This manual shall be included as an ASCII file titled READ.ME that is included with all distributed digital data.

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10.2.1.3 No digital data will be acceptable until proven compatible with the CEHNC Graphics System. All revisions required to obtain compatibility with the CEHNC Graphics System shall be done at the contractor's own expense.

10.3 DIGITAL FORMAT FOR INTERGRAPH SURVEY / MAPPING DATA

10.3.1 All data shall conform to the Tri-Service Spatial Data Standards (TSSDS) and as outlined in the specific delivery order.

10.3.2 Sources and Standard: The TSSDS have been developed and produced by the Tri-Service CADD/GIS Technology Center. They are designed for computer assisted mapping methods that must interface with other surveying firms, Government contractors, and customers so that the final product will be usable with consistent CADD documents.

10.4 GEOGRAPHIC INFORMATION SYSTEM (GIS) INCORPORATION. The A/E or contractor shall take the GIS data, manual, file, and database structure from the CEHNC GIS standard and apply it to the projects to the extent required to create the products outlined in the delivery orders specific SOW. The standard shall be used as a starting point to load data and to create a GIS tailored for the specific ordnance investigative needs of the site. All digital data shall be created using Microstation 5.5 and Intergraph's MGE GIS tools to allow it to be loaded directly into the CEHNC Ordnance GIS system. The main purpose of the GIS is to assemble all the data required to associate the non-intrusive subsurface geophysics investigative data to its correct geographical location, the relational database, mapping and remote sensing data. The GIS tools are used to manage the project, assemble data for the administrative record, help determine areas requiring further investigation and to discriminate ordnance and explosives waste from background anomalies. The discrimination is done by a program that uses a subset of the GIS data called the OE Knowledge Base (OE-KB). The OE-KB's purpose is to collect, analyze and store key investigative information for ordnance from multiple ordnance GIS systems, geophysical sensors and techniques, remote sensors, and existing imagery and compile it to establish a knowledge base of characteristics of investigated ordnance. An objective is to establish a profile or fingerprint of a specific ordnance item that can assist in evaluations for current and future projects. A proven product will be provided for use in this contract with technical support and updates provided by CEHNC.

10.5 COMPUTER FILES. All final text files generated by this contract and other individual task orders shall be furnished to CEHNC in MS Word 6.0 or higher software, IBM PC compatible format and in Adobe Portable Document Format (PDF), suitable for viewing, without modification, on the Internet. Freeware versions of Adobe Acrobat Reader, Netscape, and Internet Explorer shall accompany the text files on CD-ROM, so that the user can use the CD to either install the programs and text files on a machine, or use the CD in a stand alone mode to view the text files. The basic software supported to the field shall be capable of operating on a typical single Intel Pentium processor PC utilizing the Windows NT version 4.0 operating system with a minimum of 32 megabytes of memory and adequate disk storage for project data. All in progress and fielded GIS data, design drawings, survey data, relational databases and related data generated may be required to be available on line to the government through the use of an Internet connection. Formal submittals for all GIS, survey and mapping data, and design drawings, generated by the contractor under this contract shall be submitted in the proper format and media that will permit their loading, storage, and use without modification or additional software on the CEHNC GIS workstations. The base GIS workstations consist of Intel dual Pentium GIS machines with 96 megabytes of memory. The workstations run under the Windows NT 4.0 operating system with Microstation utilizing the MGE 6.0 compliment of software and the Oracle relational database. Current GIS project related software includes: Microstation 5.5, Oracle 8.0, IRAS B, IRAS C 5.04 and IRAS Engineer, DB Access, MGE Basic Nucleus, MGE Analyst, MGE Map Finisher, MGE Projection Manager, MGE Grid Analyst, MGE Modeler, MGGA, ERMA Data Manager, ERMA Site Geologist, Inroads, and Insitu. Other specific packages to be considered must be proposed to CEHNC for approval and for system and mission compatibility. All GIS data for formal submittals shall be on either eight millimeter NT 10 Gigabyte tape, PC 3.5" floppies or PC CD-ROM. The PC CD-ROM is the preferred format, supplemented with 10 Gigabyte tape for larger data sets.

10.6 ITEMS AND DATA. The following items and data shall be submitted to CEHNC (submittal dates will be specified for each delivery order) :

10.6.1 Field survey. The original copies of all field books, layout sheets, computation sheets, abstracts, and computer printouts. All of these items shall be suitably bound, and clearly marked and identified.

10.6.2 A tabulated list of all control points (monuments, aerial targets and corners) showing the adjusted coordinates and elevations (in meters and feet) established and/or used for this survey.

10.6.3 The negatives and three sets of prints of the aerial photographs taken for the project, if aerial photography is required in the SOW.

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10.6.4 A tabulated list of all UXO items with location information, or specific anomalies, as identified in the individual project SOW that were located in the field.

10.6.5 A "Report on Establishment of Survey Mark" (Description Card) on each permanent control monument established and/or used for the survey. In addition to the name or ID number of the monument, the cards shall show the adjusted coordinates, the adjusted elevations, a typed description for locating the monument, and a sketch showing how to locate the monument.

10.6.6 All unique items created and/or used to create the end products and the narrative and description required by the SOW.

10.6.7 Drawings and Digital Data. All maps shall be drawn on 841mm by 594mm (standard metric A-1 size drawing) reproducible (Mylar) drawings generated by the CADD system. One original Mylar and five blueline prints of each final map, and two copies of the digital data shall be delivered to CEHNC.